



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,360	02/10/2004	Liang-Sheng Liao	87450RLO	1223
7590 Pamela R. Crocker Patent Legal Staff Eastman Kodak Company 343 State Street Rochester, NY 14650-2201		EXAMINER LIN, JAMES		
		ART UNIT 1792		PAPER NUMBER
		MAIL DATE 04/11/2008		DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/775,360

Applicant(s)

LIAO ET AL

Examiner

Jimmy Lin

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 7-10 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 11 and 13-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date 2/10/04
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date: ____
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species 1 in the reply filed on 1/11/2008 is acknowledged.
2. Claims 7-10 and 12 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/11/2008.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 recites the limitation "the compartments". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1, 3-4, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Namiki et al. (U.S. Patent No. 5,429,884) in view of Ishikawa et al. (U.S. Publication No. 2001/0012571).

Namiki discloses a method of making an organic EL element (abstract). A cathode can be formed of an alloy of strontium and magnesium, wherein the concentration of strontium is in the range of 10 to 40 parts by weight to 100 parts by weight of magnesium (col. 2, lines 7-22). A Mg-Sr mixture can be prepared into a single source and cathode film can be formed by thermal evaporation (col. 7, lines 3-25).

Namiki does not explicitly teach that the differences of the vapor pressure between magnesium and strontium are within two orders of magnitudes at a selected evaporation temperature. However, the present specification and claim 4 exemplify a magnesium and strontium mixture as being preferred examples of the present invention. Because Namiki teaches the same mixture, the magnesium and strontium of Namiki must necessarily have a vapor pressure difference less than two orders of magnitude.

Namiki does not explicitly teach pumping the evaporation chamber down to a predetermined vacuum condition. However, Ishikawa teaches that it was extremely well known in the art to perform vapor deposition in a vacuum. The deposition can be for the formation of a cathode [0105]. Because Ishikawa teaches that such operating parameters were operable in the art, it would have been obvious to one of ordinary skill in the art at the time of invention to have pumped the deposition chamber of Namiki to a vacuum atmosphere and to have performed the thermal evaporation in a vacuum with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Claims 13,15: Namiki teaches that the evaporation materials are mixed together in an evaporation source having at least one compartment.

8. Claims 1, 3, 5-6, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liao et al. (U.S. Publication No. 2003/0152801) in view of Hosokawa et al. (U.S. Publication No. 2003/0018218).

Liao teaches a method of making an organic EL device. A cathode can be formed on the EL device through co-evaporation of magnesium with silver or aluminum [0004]. The evaporation can take place in a vacuum atmosphere and can be effected by a heating means [0146].

Liao teaches that the evaporation materials are placed in a plurality of sources, but does not explicitly teach placing the evaporation materials in a single evaporation source. However, Liao does teach that dual source evaporation is necessarily more complicated than single source evaporation [0004]. Such a teaching would have suggested that the use of a single evaporation source would have been less complicated than the use of multiple evaporation sources. More specifically, the teaching would have suggested that the evaporation of magnesium with silver or aluminum would have been less complicated if they were placed in a single evaporation source as compared to using separate evaporation sources for each evaporation material. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have performed the evaporation of the cathode materials using a single evaporation source method, as opposed to a dual evaporation source method, with a reasonable expectation of success. One would have been motivated to do so in order to have performed a less complicated evaporation process.

Liao does not explicitly teach that the differences of the vapor pressure between each of the evaporation materials are within two orders of magnitudes at a selected evaporation temperature. However, Hosokawa teaches that it was well known to use an alloy of aluminum and gold as a cathode [0052]. The teachings of Liao and Hosokawa would have presented a recognition of equivalency in the prior art and would have presented strong evidence of obviousness in substituting one alloy for the other in a process of forming a cathode of an EL device. The substitution of equivalents requires no express suggestion. See MPEP 2144.06.II. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used an alloy of aluminum and gold, as opposed to an alloy of magnesium and silver or aluminum, in the process of Liao with a reasonable expectation of success. The present

specification exemplifies aluminum and gold as one of the preferred mixtures of the present invention and, thus, the vapor pressures of the metals must necessarily be within two orders of magnitudes.

Claim 6: Hosokawa also teaches that the cathode can be an alloy of aluminum and silver [0052]. It would have been obvious to have used such an alloy as the particular cathode material of Liao for substantially the same reason as discussed immediately above.

Claims 13,15: Liao would have suggested mixing the evaporation materials together in an evaporation source having at least one compartment.

9. Claims 1 and 3-4 rejected under 35 U.S.C. 103(a) as being unpatentable over Liao '801 in view of Hosokawa '218 as applied above, and further in view of Namiki '884.

Liao does not explicitly teach that the evaporation materials can include magnesium in combination with ytterbium, antimony, strontium, or zinc. However, Namiki teaches that it was well known to use an alloy of magnesium and strontium to form a cathode of an EL element. The teachings of Liao and Namiki would have presented a recognition of equivalency in the prior art and would have presented strong evidence of obviousness in substituting one alloy for the other in a process of forming a cathode of an EL element. The substitution of equivalents requires no express suggestion. See MPEP 2144.06.II. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used an alloy of magnesium and strontium, as opposed to an alloy of magnesium and silver or aluminum, in the process of Liao with a reasonable expectation of success. The present specification exemplifies magnesium and strontium as one of the preferred mixtures of the present invention and, thus, the vapor pressures of the metals must necessarily be within two orders of magnitudes.

10. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Namiki '884 in view of Ishikawa '571 as applied to claim 1 above, and further in view of Yamamoto et al. (U.S. Patent No. 6,179,923).

Namiki does not explicitly teach monitoring the total evaporation rate to a predetermined value by adjusting the applied electrical power, opening a shutter to start evaporation, closing the shutter when the thickness of the electrode layer has reached a predetermined value, and turning

off the power supply. However, Yamamoto teaches that it was well known to use a shutter to allow vapor flow from the source materials to pass or to be blocked at the start or end of deposition (col. 4, lines 30-33). The heater is operated by a power supply connected to the heater (col. 7, lines 43-47). Power is supplied to the heater to effect evaporation and the power is turned off when the deposition is complete. Adjusting the power of the heater necessarily controls the evaporation rate of the evaporation materials. Because Yamamoto teaches that such steps were operable in the art of vapor deposition, it would have been obvious to one of ordinary skill in the art at the time of invention to have adjusted the power supply, opened the shutter, closed the shutter, and turned off the power supply in the vapor deposition method of Namiki with a reasonable expectation of success.

11. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liao '801 in view of Hosokawa '218 as applied to claim 1 above, and further in view of Yamamoto '923 for substantially the same reasons as discussed immediately above.

12. Claims 3 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Namiki '884 in view of Ishikawa '571 as applied to claim 1 above, and further in view of Hosokawa '218.

Namiki does not explicitly teach that the cathode can be aluminum in combination with tin, copper, neodymium, scandium, or gold. However, Hosokawa teaches that it was well known to use an alloy of aluminum and gold as a cathode [0052]. The teachings of Namiki and Hosokawa would have presented a recognition of equivalency in the prior art and would have presented strong evidence of obviousness in substituting one alloy for the other in a process of forming a cathode of an EL element. The substitution of equivalents requires no express suggestion. See MPEP 2144.06.II. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used an alloy of aluminum and gold, as opposed to an alloy of strontium and magnesium, in the process of Namiki with a reasonable expectation of success.

Claim 6: Hosokawa also teaches that the cathode can be an alloy of aluminum and silver [0052]. It would have been obvious to use such an alloy as the particular cathode material of Namiki for substantially the same reason as discussed immediately above.

13. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Namiki '884 in view of Ishikawa '571 as applied to claim 1 above, and further in view of Forrest et al. (U.S. Patent No. 5,703,436).

Namiki does not explicitly teach that the evaporation source can be made of a metal or compound having a melting point higher than 1500 °C. However, Forrest teaches that it was well known to have used an evaporation source made of molybdenum in the process of thermal vapor deposition (col. 20, lines 4-27). The present specification exemplifies molybdenum as a material having a melting point higher than 1500 °C. Thus, the molybdenum evaporation source as taught by Forrest must necessarily have a melting point temperature higher than 1500 °C. Because Forrest teaches that such evaporation sources were operable, it would have been obvious to one of ordinary skill in the art at the time of invention to have used molybdenum as the particular material for the evaporation source of Namiki with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

14. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liao '801 in view of Hosokawa '218 as applied to claim 1 above, and further in view of Forrest et al. '436 for substantially the same reasons as discussed immediately above.

15. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liao '801 in view of Hosokawa '218 as applied to claim 1 above, and further in view of Yamazaki et al. (U.S. Publication No. 2003/0162314).

Liao does not explicitly teach that the evaporation materials are placed separately into each of the compartments in the evaporation source. However, Yamazaki teaches that it was well known in the art to use a single evaporation source 201 having multiple compartments to

hold different evaporation materials (Fig. 6). The evaporation source can hold evaporation source 203a and evaporation source 203b in separate compartments [0070]. One of ordinary skill in the art would have recognized that any evaporation source capable of holding both the evaporation materials would have been operable for forming the cathode film of Liao and Hosokawa. Because Yamazaki teaches that such an evaporation source was operable in the art of vapor deposition and because one of ordinary skill in the art would have expected that placing each evaporation material in separate compartments of a single evaporation source would have been operably equivalent to placing all the evaporation materials into a single compartment, it would have been obvious to one of ordinary skill in the art at the time of invention to have used the evaporation source having multiple compartments as the particular evaporation source of Liao and to have placed each evaporation material in a different compartment with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is (571)272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit: 1792

/Jimmy Lin/
Examiner, Art Unit 1792

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit
1792